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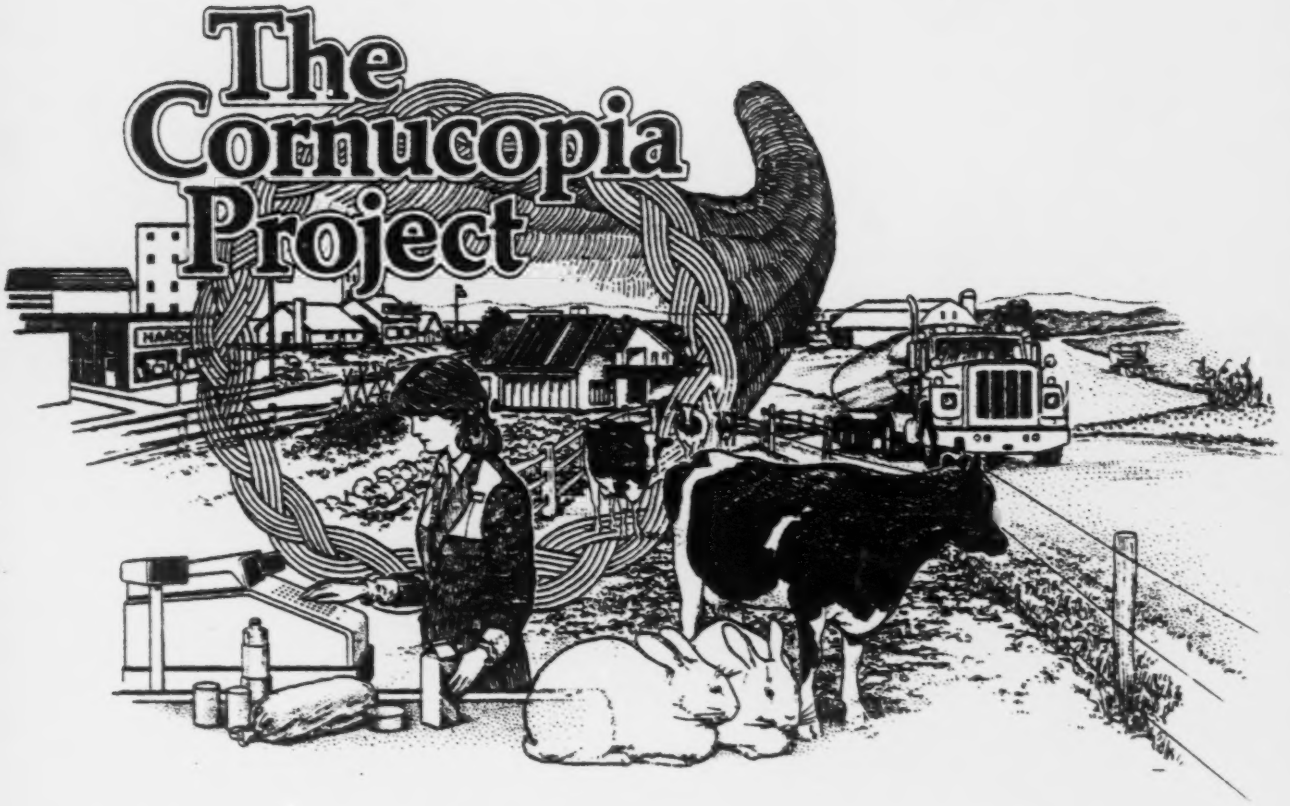

THE FLORIDA FOOD STUDY: THE UNDERMINING OF OUR FOOD SUPPLY

A Study of the Food System of Florida by
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and
The Cornucopia Project of Rodale Press
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Emmaus, Pennsylvania 18049
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Introduction

The Florida peninsula dips like a crooked thumb into the warm waters of the Gulf of Mexico and the Atlantic Ocean. Its sandy soils are low in natural fertility and its subtropical climate is a haven for pests and diseases. Recently, if it hasn't been a dry year it's been a cold one.

Yet, despite these drawbacks, this odd-looking state produces 70 percent of the citrus and 19 percent of the sugar in the nation.[1] In addition, Florida ranks second to California in the production of vegetables and is the top domestic producer of winter vegetables to the Northeastern United States.[2] Six of the top 100 agricultural counties are located in Florida.[3] All together, the state leads the nation in the production of over fifteen agricultural commodities[4] and ranks twentieth in export sales.[5]

The pillars that uphold Florida's agriculture, however, are beginning to crumble. Each crack in the system widens as we increase our dependence on non-renewable fuels and resources. These discoveries warrant immediate concern:

* Over 60 percent of the food we eat is produced outside the state.[6]
* We spend nearly $5 billion every year on food from outside the state; transportation of this food into Florida alone costs us nearly $250 million.[7]
* Farmland acreage has declined 27 percent over the past 25 years (Miami alone has taken over 53,000 acres of farmland).[8]
* The state's infertile, porous soil requires seven times more fertilizer per acre than the national average.[9]
* Florida has been suffering through a decade of sparse rainfall as water supplies face dangers of contamination and depletion.

* Foreign competition for fruit and vegetable marketing is a threat to Florida growers as countries like Mexico and Brazil sell their produce at extremely low prices.

* Approximately 8.6 percent of Florida farms control more than three-fourths of the total farm acreage.[10]

* Florida is the second highest pesticide user in the country.[11]

* Florida's phosphate production accounts for 75 percent of the national total, yet scarcity is feared within 20 years.[12]

* Florida imports more than 90 percent of all energy used in the state.[13]

Many of these problems are occurring across the country and around the world. Every day, while the U.S. population grows by 5,000, the nation loses the productive equivalent of 25 square miles of agricultural land to erosion and farmland development. In addition, repeated heavy applications of chemicals and continuous single-cropping are destroying the fertility of our soil, and the supply of fertilizer materials is depleting rapidly.

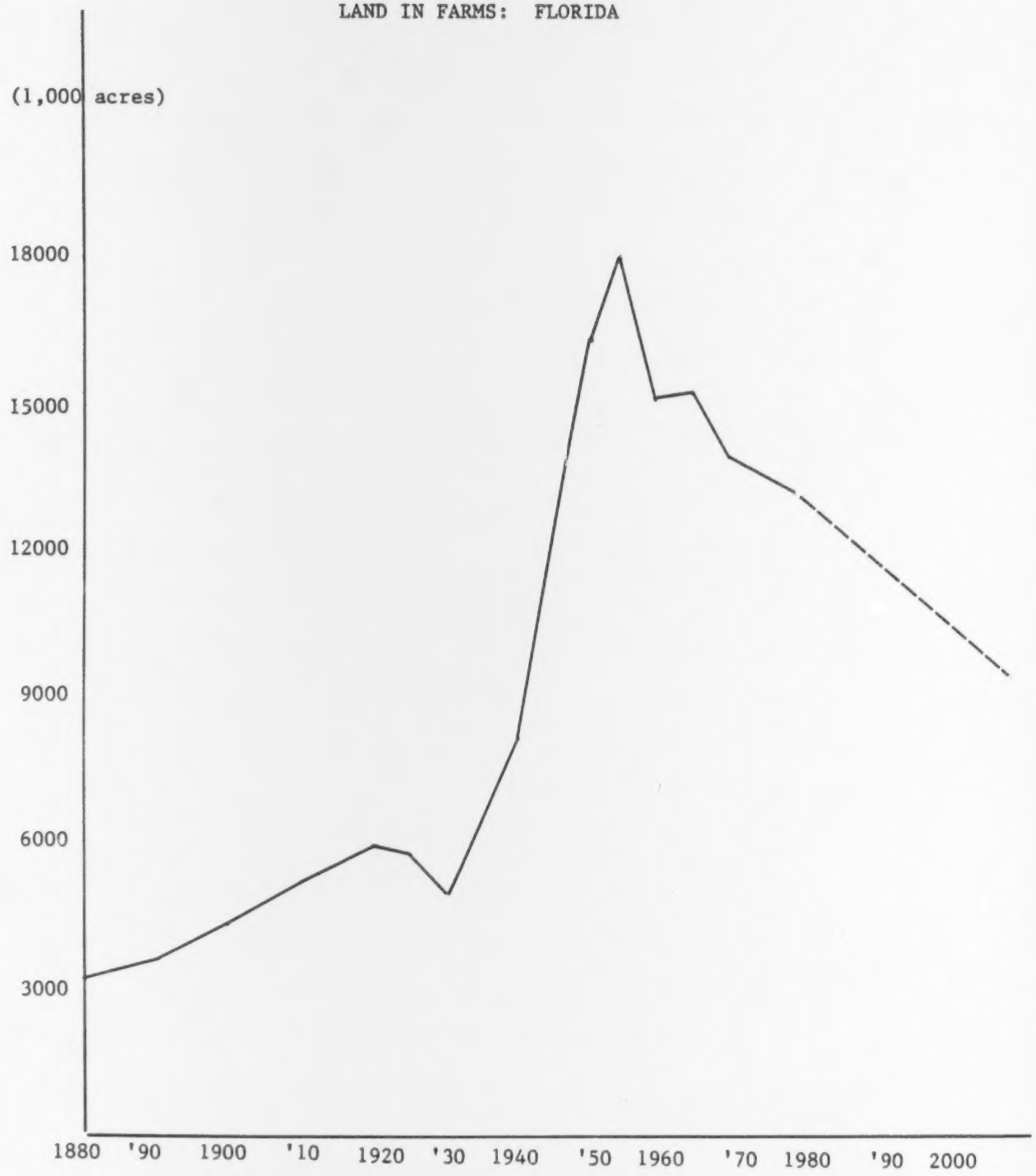
Florida's agriculture is often considered an economic shock absorber relative to the other economic sectors of tourism and construction. Maintaining this stabilizing nature of Florida's agriculture makes it even more vital to adopt new production and distribution methods. The greater the dependence on current sources of energy inputs, the higher the risk of disruption to our food supplies.

Nationally, processing, packaging, and transporting food uses 60 percent more energy than all the farms that produce our food.[14] Florida imports virtually all of its processed foods and spends over $40 million a year to ship its unfinished calves to Western grain fields and to transport back steaks and hamburgers.[15] Dependence on long-distance food transport makes supplies tenuous in many areas.

Florida's food system, like others, is vulnerable. An energy cutback, a transportation strike, a freeze, drought, or labor dispute could mean a food crisis. Our method of producing food is wearing away our state's productive capabilities. In earlier times, a food system that consumed resources so heavily seemed to make sense. In today's world, it does not.

But the situation is far from hopeless. Florida has the resources, both in land and people to change this dangerous position. We can preserve our farms and farmland, increase our self-reliance, and develop a secure food supply, if we act now. The purpose of this report is to help us begin to do that.

LAND IN FARMS: FLORIDA



Source: U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States Colonial Times to 1970 (Washington, D.C.: GPO, 1975), pp. 458,459; U.S. Department of Agriculture, Agricultural Statistics 1981 (Washington, D.C.: GPO, 1982), p. 416.

The Frightening Facts

It's all too easy to get a false sense of security about Florida's food supply with a glance at the statistics. After all, Florida ranks eleventh nationally in agricultural sales and first in the Southeast. The state's agriculture nets some $3.8 billion in cash receipts and generates a $12 billion agribusiness economy that employs an impressive 22 percent of all civilians in Florida.[16]

The list of honors is a lengthy one. The Sunshine State leads the nation in orange, grapefruit, sugarcane, lime, and mango production and ranks second in tomato and honey production.[17] Florida also rates as one of the top ten U.S. producers of peanuts, potatoes, eggs, fish, and lettuce and is the ninth leading state in beef numbers.[18] Citrus sales, livestock and products, and vegetables and melons accounted for a third, a quarter, and a fifth, respectively, of 1980 cash receipts.[19]

Despite these agricultural success stories, 65 percent of the food Floridians consume is imported from states as far away as Oregon.[20] Florida residents spent over $9 billion for food in 1980--$971 for every child, woman and man in the state. Of this amount, $6 billion was paid for food produced outside Florida. About $10.8 million leaves the state each day to pay for our imported foodstuffs.[21]

Florida may find itself importing even more food if the population keeps rising while acres of available farmland keep dwindling. Florida's booming population, which is 80 percent urban, grows 3 percent each year, the fourth highest rate in the nation.[22] Yet from 1966-1977, Florida experienced the greatest loss of farmland in the U.S., totaling 3.47 million acres, an area 2½ times the size of Dade County.[23]

Dade County, alone, has lost over 35,000 acres of agriculture land in the past 15 years. Roughly 70,000 acres of farms and groves

producing 52 commercial winter crops are at stake--crops grown nowhere else in the country. Present rates of farmland loss could mean the end of this essential production by the year 2000.[24]

Current efforts are underway by Dade County in an Agricultural Land Use Planning Project. Through land use controls, planners hope to stop the urban cannibalism like that in Broward County, where development has forced farmers off all but 5.9 percent of the county's land since 1950.[25] Neighboring counties face the same dilemma--people versus crops.

As urban development swallows up South Florida's farmland, land values continue to escalate. Over the past decade, Florida agricultural real estate has shown a threefold increase from $5.2 billion to $15.1 billion.[26] In Palm Beach County, an acre that once grew beans now sells for as high as $50,000.[27]

As a result, speculators own a great deal of the land planted in fruits and vegetables, and they wait like hawks for the opportune time to sell out to developers. For instance, in 1979, approximately 95 percent of the South County agricultural area was leased to farmers. Many of these farmers work on a crop-to-crop basis and have little say over the future of their $60,000,000 plus winter vegetable industry.[28] Statewide, roughly a quarter of the farms are leased or rented.[29]

Northern Florida also suffers from loss of farmland. Most of the prime farmland, which is the best land for farming, is located in the northern and western areas of the state. But between 1958 and 1977, Florida lost 37 percent of its prime farmland to nonagricultural use--some 639,000 acres.[30]

Over half of the 44,068 farms in Florida work only 3 percent of the state's farmland. A mere 8.6 percent of the farms (those over 500 acres) control over three-fourths of the farmland.[31] This skewed distribution of power over the bulk of Florida's farmland means that fewer hands control the direction of Florida's food system. A system dependent on large farms is less flexible or adaptable in times of stress than one composed of many small farms. A recent USDA study concludes that consumers benefit little in terms of lower real food costs from further increases in farm size over the medium-sized farm that grosses from $41,000-$76,000. Roughly 14 percent of the farms in Florida gross over $76,000. The same study also claims that a 143 acre farm in the Southeast can be 90 percent as efficient in terms of production costs as a 399 acre farm.[32]

Unlike land lost to parking lots and buildings, land lost through soil erosion often goes unnoticed, especially in the nearly level areas of Florida. Florida's annual soil losses average between 2 and 5 tons per acre, amounts that fall within the range of annual soil loss tolerance limits for most soils.[33]

But averages can be misleading. Of Florida's total cropland, 21.5 percent of the acres erodes at a rate greater than 5 tons per acre a year, and over 100,000 acres exceed 14 tons per acre.[34] The amount of soil eroded from cropland, pastureland, rangeland, and forestland totaled more than 14 million tons in 1977[35] enough to cover the city of Fort Lauderdale with 5½ inches of soil every year.[36]

Each acre-foot of this eroded topsoil can store about two inches of available water for crops, and contains 8,000 pounds of phosphorus.[37] So through erosion, Florida loses about 69.3 million pounds of nitrogen and 17.3 million pounds of phosphorus.[38] These figures represent 8 percent of the nitrogen and 10 percent of the phosphate used in fertilizers over one year in the state--an annual loss equivalent to over $11 million in fertilizer materials.[39] And this does not include the 470 million gallons of water storage capacity lost or the long-term decrease in the productivity of the soil.

Loss of fertilizer value is especially crucial because Florida's infertile, porous soil requires seven times more fertilizer than the national average.[40] With such a high fertilizer demand, future supplies of nitrogen, phosphorus, and potassium sources will have a profound impact on Florida's agricultural productivity.

One of the richest phosphate deposits in the world is the Bone Valley formation in central Florida, which accounts for 75 percent of total U.S. production of phosphate.[41] Future demand for phosphate rock is expected to be similar to today's market. Production, however, is expected to peak in 1990, at 60.8 million metric tons, and decline thereafter. Consequently, the supply of phosphate rock is projected to be adequate to meet demand only until 1992.[42]

Worldwide, fertilizer consumption has increased five times since the 1940's.[43] In Florida alone, 1980 consumption of fertilizer mixtures and direct application materials totaled over two million tons of nitrogen, phosphorus, and potash.[44] Such energy-intensive systems of crop production face serious problems as the nonrenewable resources of petroleum, phosphate and potash become rapidly depleted.

Future supplies of petroleum will also affect the transportation of agricultural produce. In 1979, Florida fruit and vegetable producing areas shipped over 6.8 billion pounds of fruits and vegetables to domestic markets, accounting for 17.3 percent of total U.S. fresh fruit and vegetable shipments.[45]

Trucking accounted for 98.7 percent of this "perishables" traffic, compared to 66.7 percent in 1960. Rail shipments accounted for a mere 1 percent of the traffic in 1979 versus 30 percent in 1960. Within two decades, dependence on trucks had increased by a third. Yet compared to trucking, rail transportation is the more efficient mode in fuel per ton-mile.[46]

Refrigerated trucks are another expense in transporting agricultural perishables. These trailers are expensive, especially to independent owner-operators. There is little incentive for empty refrigerated trailers to pick up a northbound load of fruits and vegetables from southern production areas.[47] In addition, vegetables are mostly harvested at the same time that other produce transportation demands are high throughout the country. Thus, competition for markets and trailers plus the seasonality of Florida's shipments increase the likelihood of a trailer shortage. Three years ago, for example, a trucker strike caused nearly one-fourth of the melon acreage to go unharvested.[48]

In 1980, Florida became the first state to deregulate motor carriers. One report claims that deregulation has left fewer firms to transport Florida's perishables. In essence, previously exempt commodity haulers can now transport regulated products. During peak shipping seasons, the

remaining trucking firms have in the past threatened a slowdown or strike because of operating expense.[49] There may be ample truck ownership today, but as changes like deregulation and fuel cost increases come about, the need for alternative transportation modes grows more acute.

Economically, Florida relies heavily on the export of citrus and vegetable products. Oranges account for 71 percent of total citrus sales, and tomatoes make up 31 percent of total vegetable and melon sales.[50] Close to 100 percent of Florida's fruits and vegetables are consumed fresh, with 85 percent of the oranges and 90 percent of the tomatoes shipped out of state.[51] Economic and natural events, however, can act to sever this dependence on exports.

Foreign competition is one element that can weaken Florida's food economy. In 1978, south Florida tomato farmers filed federal produce dumping charges against Mexico. They claimed that, since 1964, Mexicans had been selling tomatoes at illegally low prices during peak Florida production periods. The Mexican growers could afford to underprice Florida growers through a 30 percent cut in production costs with the use of less expensive pesticides that have been banned in the United States. Prices were depressed so severely in 1979 that two major south Florida grocery chains bought Mexican tomatoes in Nogales, Arizona and trucked them to Florida instead of buying Florida grown tomatoes.[52] Currently, the battle rests in court.

Foreign imports have had a less heated effect on the orange juice industry. Americans drink more orange juice than the United States produces and Brazil fills the gap. In 1981, Brazil shipped a record 56 million gallons of orange juice to the U.S., the bulk of which entered Florida supply channels.[53]

Depending on how it is viewed, importing from Brazil is either good or bad news. Economically, imports can make sense. According to one economist, Florida growers could make more money without orange juice imports from Brazil, but without imports, the market would be more volatile. Imports help to stabilize prices in times of natural disasters that hurt orange crops.[54]

For instance, the killing frost that hit Florida's orange-growing areas on January 11 and 12, 1982 may push Brazil imports into the U.S. up to 75-100 million gallons, a 25-50 percent increase over last year.[55] Therefore, Brazil can act as an effective supply source and help keep down retail prices that would otherwise be higher.

On the other hand, imports could severly hurt the Florida grower. As more land is lost to development, imports from Brazil could take a dangerously large share of the citrus market. Development pressures are largely responsible for the 110,000 acre decrease in southern Florida citrus areas since 1970.[56] Imports <u>can</u> help stabilize the market, but when the world economy is highly unstable, dependence on imports can lead to unstable prices in the United States.

The freeze in January, 1982 created a heavy loss of Florida grown oranges. Approximately 28 percent of the orange juice concentrate yield has been estimated as lost to the freeze, an equivalent of 51 million gallons.[57] Only a year ago, a two-day freeze cut production of orange juice concentrate by 65 million gallons.[58] And in 1977, three nights of subfreezing temperatures virtually destroyed the winter vegetable crop, 65 percent of the midseason oranges, and more than a third of the grapefruit crop.[59] It doesn't take much. Four hours of a 28°F temperature and citrus fruit gets beat by the cold.[60]

A recent and growing problem of alarm to Florida farmers and residents is the acidity of Florida rainfall. Acid rain has increased over the past 25 years to pH levels on par with that of lemon juice or vinegar.[61]

Acid rain is usually associated with northern coal producing areas. High rainfall and the low buffering capacity of northern Florida soils, along with increased population and shifts to coal as an energy source have combined to intensify acidic rain in the south.

Crops and fisheries may feel acid rain's impact most. The acid can cause holes in lettuce, spots on tomatoes, and retardation of plant growth. In addition, nutrients are leached from the soil that will require even more fertilizer to replace lost nutrients. Fish may fail to reproduce and can be killed, as has happened in the Adirondack Mountains of New York, where more than 300 lakes are estimated to be sterile.[62]

Rainfall averages over 50 inches a year in Florida, making the Sunshine State one of the wettest in the nation. With development, however, came 1,400 miles of canals and waterways that drained what was once a sponge of swamps, marshes, and flood land to agricultural fields and urban developments. In southern Florida, drainage has lowered water tables as much as 6 feet below levels recorded in 1900.[63] As a result, surface water quality has been threatened and water flow into underlying reservoirs, or aquifers, has been restricted.

Florida is unique among other states, since 92 percent of the population and 70 percent of the agricultural requirements depend upon groundwater for their water needs.[64] The Floridan Aquifer, one of the world's most productive underground water supplies, is estimated to hold more water than all five of the Great Lakes combined.

Still, Florida faces water shortages. The problem is that only a fraction of the Floridan Aquifer water can be withdrawn. Water that is up to three times saltier than ocean water underlies all of Florida, and salt water intrusion is inevitable and irreversible if the level of fresh water is drawn below sea level.[65]

For replenishment, the Floridan Aquifer relies on rain which falls primarily from June to mid-October. Only 10 percent of this seasonal rainfall ultimately filters through to the underground reservoir.[66] Furthermore, for the past eight years, rainfall has been below normal, and over the past 20 years, Florida has experienced a 75 inch rain deficit.[67]

Whether the state is in early stages of desertification or under a drought cycle is a question on the minds of concerned Florida residents. One point made is the fact that three-fourths of the land areas around the world at Florida's latitude are dry, desert areas.[68] Currently, 19 percent of the earth's land is threatened by desertification, and each year, the world loses an area the size of Maine to this drying-up process. At this rate, we could lose one-third of the planet's arable land by the year 2000.[69] In Florida, deforesting and paving over the land may contribute to the desertification process.

Both agricultural and urban users heavily tax Florida's water supplies. Between 1950 and 1977, Florida's water consumption rose five times the increase in population over the same period.[70] In densely populated regions of southern Florida, water levels in canals are kept low enough to prevent flooding, yet this means that millions of gallons of water are flushed out to sea and wasted, rather than allowed to filter through to aquifers.

Agriculture is also guilty of wasting Florida's water. The agricultural industry uses between 40 and 60 percent of the state's water[71] as it irrigates 50 percent of its cropland and 42 percent of its pastureland.[72] Indeed, Florida uses twice as much water for irrigation than all other states east of the Mississippi River combined.[73] Its irrigated land produces over 80 percent of the value of crops produced.[74]

A 1976 national study estimates that at least half of irrigation water is wasted either in inefficient techniques or in low-value crops. In Florida, over 2 million acres use surface, or open-ditch, irrigation systems. This system delivers water quickly, easily, and inexpensively, but only 50-60 percent of the applied water actually reaches the plant for use. In Florida, nearly 900,000 acres utilize sprinkler systems, which get 10-25 percent more water to the plants compared to surface irrigation techniques.[75]

Attempts are currently underway to improve irrigation management of the fertile but decaying 750,000 acres of muckland around Lake Okeechobee, where sugarcane and vegetables are important crops. The muck is gradually oxidizing and shrinking as a result of 50 years of drainage that has robbed the soil of water and exposed it to air and sunlight. Since 1924, almost five feet of "subsidence," or shrinking has occurred. Researchers predict that large tracts of the muckland could become unsuitable for vegetable or sugarcane production by the year 2000 if current agricultural practices don't change.[76]

In east and central Florida, groundwater levels dropped as much as 11 feet below normal during a record breaking 1981 drought that caused the following:[77]

* Lake Okeechobee's water level fell 7 feet below normal, too low to recharge the surficial Biscayne Aquifer, a crucial water source for the fruit and vegetable counties of Dade, Broward, and South Palm Beach.

* Massive fish kills occurred in Lake Apopka and St. Johns River.

* In Winter Park, a sinkhole 400 feet wide and 75 feet deep swallowed a house, half a city swimming pool, telephone poles, and cars because the water table had dropped too low to support an underground limestone cavern.

* Saltwater intruded into some drinking water wells and mandatory limits on water use were imposed by three water management districts.

Five water management districts were set up in Florida under a Water Resources Act of 1972. Whether these districts will have a significant impact on the future of Florida's water supply is unclear. Water-use permits are now required by anyone who wishes to use Florida water for other than domestic purposes. Yet in its seven years under the consumption use permit system, the South Florida Water Management District has never denied a permit application.[78] Strong political and economical forces also interfered with proper water conservation policies.

One of Florida's attributes to its food supply is the fishing industry. In 1979, the state's commercial fisheries landed over 167 million pounds of fresh and saltwater fish from the Gulf of Mexico and the South Atlantic Ocean. Compared to other states, Florida ranks tenth in tonnage of fish landed and sixth in fish value.[79]

Valuable shellfish account for about 68 percent of Florida's total value of landings. However, heavy reliance on exporting high-value fish such as shrimp and lobster, could possibly spell financial problems. Over the past 20 years, high profits have led to a 76 percent increase

in shrimping boats and vessels. But as income for nonessential food products drops, so does demand, and the industry suffers through lower prices. Soaring fuel costs and increased competition with foreign imports only act to undermine the soundness of commercial fisheries.[80]

Environmental concerns also play their part in undercutting fish productivity. Along Florida's 11,000 mile coastline lie estuaries, areas in which an arm of the sea meets the mouth of a river. Roughly 85 percent of the commercial fish and shellfish in Florida are estuarine-dependent during their juvenile or breeding stage.[81] Freshwater flowing from a river into an estuary helps to dilute and push the saline water out to sea. This freshwater flow increases the protection against predators and enhances a productive food chain. But dredge and fill projects, land reclamation, flood control, mosquito control structure, dams, and canals impede this essential flow of freshwater.[82] Also threatening fish survival is the ingestion of pesticides, heavy metals, industrial contaminants, and petrochemicals that find their way into the estuaries.

Fish are not the only species blindly affected by the unjudicious use of pesticides and insecticides. So, too, is man. In one year, agricultural products are estimated to have used 30.3 million pounds of pesticide ingredients. Citrus production alone accounts for 41 percent of agricultural pesticides use.[83]

Studies show, however, that the place of pesticides in future crop productivity will probably be weakened for reasons of health, expense and ineffectiveness.

* Currently, more than 364 species of insect pests have developed resistance to pesticides--breeding what experts call "superpests."[84]

* Levels of DDT and its metabolite, DDE, are nearly twice as high in residents of a warmer state like Florida compared to people in northern states.[85]

* In 1980, the Environmental Protection Agency confirmed 102 pesticide poisonings and 4 deaths caused by pesticides in the south Florida area.[86]

* Of 132 college male students tested, 23 percent had sperm counts of 20 million or less per milliliter of semen, the equivalent of being sterile. Such evidence has been associated with the introduction of chemical pesticides during the 1940's and 1950's, the same time that male fertility began to drop.[87]

* Pesticides have also been suspected as a cause for rates of birth defects that are twice as high in agricultural areas of Dade County as nearby urban areas.[88]

* Blood tests of some Dade County pest exterminators show greatly reduced levels of the important enzyme, cholinterase, that regulates chemical transmission of nerve impulses.[89]

In addition, migrant workers who help raise and harvest winter fruits and vegetables in South Florida are plagued with substandard, poorly ventilated housing. The unsanitary migrant camps favor roach and fly infestations that increase the use of domestic pesticides use.[90] Therefore, these workers are exposed to both pesticide residues on crops as well as in their homes. Homeowner pest control in all of Florida involved 2.3 million pounds of pesticides.[90a]

What Do These Facts Mean?

These disturbing facts and figures can be summed up in a few words--Florida's food system is vulnerable. Our supplies of meats, grains, processed vegetables, and various dairy products depend on outside producers. An oil embargo, energy shortage, labor dispute, or crop failure--alone or in combination--could lead to shortages of these supplies, as well as severely impair Florida's own production systems.

Trends point to an uncertain food-secure future. Demand for food rises as Florida's population creeps near the 10 million mark. Farmland gives way to streets and buildings. As a result of development, higher fuel and production costs, and unresponsive market prices, farmers may switch to crops that require less energy and less land while proving more profitable to grow. For instance, in 1978, there were 173 percent more commercial nurseries and greenhouses (with sales over $2,500) than in 1969. During the same time span, fruit, nut and berry farm numbers increased by only 4 percent and vegetable farms by 37 percent.[91]

Furthermore, our economy is weakened. Florida ships 65 percent of the food it produces out of state. While these export sales serve to channel outside dollars into the state and trigger chain reactions of economic activity, they also can weaken the food system if too highly depended upon. A decrease in export sales will trigger a chain of decreased economic activity within Florida. And as transportation costs rise, other states that now rely on Florida's fruits and vegetables may begin to produce more of their own tomatoes, sweet corn, and peppers.

What Can We Do?

The situation is far from hopeless. Florida's food system has the capability to be less vulnerable, without taking away from its valuable vegetable and citrus production.

Currently, over 13 million acres of land are in agricultural use, including 4.5 million acres of cropland and 8.4 million acres of pasture and rangeland. Florida's total cropland base of 6.8 million acres includes both current and potential cropland, enough to produce all the food that the state's residents consume, except beef. Beef production

alone would require another 4.6 million acres. With our present diet and production systems, we would need around 11.4 million acres of cropland to be totally self-sufficient, nearly 7 million acres over current cropland acreage.[92]

Besides not having enough cropland to be self-sufficient, Florida's soil and climate cannot support crops like asparagus, cherries, and coffee, nor are they conducive to certain high crop grain yields without the heavy use of fertilizers and pesticides. Total self-sufficiency, however, is not necessarily the desirable goal. A more realistic and feasible goal is increased self-reliance in the foods we eat to reduce food costs, raise nutritional quality, strengthen our economy, and decrease the vulnerability of our food supply.

Florida now exports over 70 percent of the fresh vegetables produced in the state. At the same time, virtually all of its frozen and canned vegetables are imported. Too great a reliance on exports can be a weak link in the food chain. By processing our own vegetables, we would spend a larger portion of our food dollars at home, dollars that would otherwise be lost by importing food products from other states and countries.

For instance, Florida exports nearly 90 percent of its tomatoes in the fresh market. Yet over 600 million pounds of tomatoes were shipped into Florida in 1980 in the form of catsup, paste, juice and canned tomatoes. If Florida would process these products in state, it could still export over 200 million pounds of its tomatoes.[93]

We also import 80 percent of our grain food products. Although sugarcane and soybeans are Florida's two leading field crops, the state still must import 38 percent of its sugar and 100 percent of its soy-based foods.[94] Again, increasing in-state processing would fuel local economies while increasing our self-reliance.

Another area in which Florida can become more self-sustaining is in the production of meat. We now import 85 percent of our beef, 97 percent of our pork, and virtually 100 percent of our lamb and mutton. Florida ships roughly 78 percent of its feeder calves to cattle feeding areas in the Southwestern and Plains states, a distance of 1,400-2,200 miles. Trucking calves out-of-state and beef back into Florida for in-state consumption has been estimated to cost $42.9 million a year, an amount equal to 12 percent of the 1980 cash marketings of Florida cattle and calves.[95]

Florida has both the land resources and slaughter capacity to raise more cattle, thereby decreasing transportation costs and boosting the state's economy. Even with cattle in-shipments, Florida's slaughtering plants operate at only 71 percent of capacity. More Florida-fed cattle could fill the meat packers' quotas as well as meet consumer demands.[96]

The 4.6 million acre land requirement for beef previously mentioned was derived using a high-grain cattle feed, which is what Florida feed-lots use to fatten their cattle--rations that are comprised of 73 percent corn grain. But for a state like Florida, a high-concentrate cattle ration is not a sustainable method. Roughly 74 percent of the corn fed to Florida cattle is imported from Georgia and the corn belt.[97]

Northern Florida has shown its potential for higher corn production, when in 1976, the corn producing counties in Florida harvested 28.8 million bushels. On dry, sandy soils where corn yields are low, grain sorghum could be developed for late season production.

With improved technology, a more resourceful supply of cattle feeds could be found in the many by-products of agricultural industries. Tons of dried citrus pulp, citrus molasses, and blackstrap molasses are produced annually. Sources of fiber could include bagasse from sugarcane, peanut hulls, poultry waste, rice bran, soybean hulls, and distillers' by-products. And with Florida's vast forest and fish resources, paper and wood wastes and fish by-products hold great potential as cattle feeds.

Grass-fed cattle will share a bigger part of the cattle industry as more consumers prefer leaner meat over the marbled (fat-streaked) meat that results from grain-fed cattle. Much of the 12 million acres used for cattle in Florida is unimproved range and woodland pasture that can produce only 40 pounds of beef per acre. But a cow-calf crop at the University of Florida is producing 400 pounds of beef per acre on improved pasture. If all 12 million acres of pasture were improved and properly managed, Florida could increase its beef production ten times.[98]

We could also stregthen our food system by increasing local fertilizer consumption. Each year, the livestock, poultry and humans in Florida produce 16 percent of the nitrogen, 25 percent of the phosphorus, and 16 percent of the potassium presently used by Florida agriculture.[99]

Current use of manures and domestic wastes rather than chemical fertilizers do involve higher labor and application costs; however, biological farming may grow more favorable as fertilizer costs rise and supplies falter. In China, for example, methane (biogas) generation from agricultural bio-products and animal wastes is extensive with 7 million generators now in use.

To help ease Florida's water problems, both urban consumers and farmers can tighten their belts. In Key West, where desalination increases water expenses, a person typically uses 90 gallons of water per day. (The national average is 200 gal/day/person.) And during the 1981 drought, farmers to the south of Lake Okeechobee got by on less than 15 percent of their normal water allotment.[100] America's water consumption habits don't always reflect true need.

A family of four typically uses 225 gallons of water each day, nearly half of which is toilet water. Everytime a toilet is flushed, five to six gallons of fresh, drinkable water are flushed away. By implementing low pressure toilets, 50 gallons of water could be saved per day. A ten-minute shower uses 50 gallons of fresh water, which can be cut in half by installing an inexpensive flow reducer.[101]

Far more inventive is the composting toilet, which uses no water at all. A composting toilet converts household food and human wastes to humus by composting wastes by microorganisms. This nutrient-rich humus can then be spread as a plant fertilizer. A similar idea is the Graywater System that filters and reuses water from the shower, bath, lavatory, kitchen sink, and washing machine.[102]

Even though farmers use raw, unprocessed water, they can still implement water-saving techniques to prolong the productive life of their soil. Instead of using the predominant surface irrigation systems, growers could install drip irrigation systems that are 90-95 percent efficient in delivering water directly to the roots of plants.[103] More growers could also install sprinkler systems, which use one-sixth of the water of surface systems.[104]

Our farmland can benefit from better utilization of local food resources. An unconventional crop like rice is showing great potential for a permanent spot in the agricultural area of the Everglades. In 1977, rice was harvested for grain for the first time since the 1950's, when fear of a virus disease halted production. By introducing rice, the flooding acts to slow down the current oxidation that robs 10-12 inches of organic soils each decade.

Currently, about 300,000 acres of Everglades land are planted in sugarcane, of which 85,000 acres lie fallow for 8 to 10 months each year. In addition, 50,000 acres devoted to different vegetables lie idle in the summer months. If this total 135,000 acres of sugarcane and vegetable land incorporated rice production, the area could produce 710 million pounds of rice each year, which is enough to satisfy the milled rice consumption of over 50 million people.

Other aquatic and semi-aquatic crops could also extend the productivity of the Everglades. There is a demand and ready market for certain Asiatic and tropical American vegetables suited for the wetlands. Watercress, water spinach, oriental waterchestnut, swamp fern and taro are some aquatics that show potential for Everglade agricultural production.[105]

Diversifying production is a key element in becoming more self-reliant. Diversification, however, will only come about if farmers can be assured of a ready market. Since diversifying would mean small, scattered acreages of different crops, direct marketing from the farmer to the consumer is the best marketing alternative. In 1978, nearly 3,000 farms in Florida grossed over $12 million in direct sales to consumers. With Florida's year-round growing season, more direct markets would serve well.

Roughly 95 percent of the blueberries produced in Florida are directly marketed through Pick-Your-Own (PYO) operations. An analysis of blueberry PYO's in Florida illustrates both producer and consumer benefits:[106]

* Growers required smaller capital requirements because of the elimination of picking, packing and transportation expenses.
* PYO outlets gave farmers greater price control and assurance of a ready market.
* Compared with prevailing prices at area supermarkets, customers saved an average of $5.94 per transaction.
* Customers rated the freshness and overall quality of the PYO blueberries higher than that of blueberries usually found at retail grocery stores.

Generally, PYO outlets offer consumers an opportunity to obtain fresh, high quality produce at reasonable prices, while increasing financial returns to farmers.

Expanding the role of home gardens is yet another approach to increasing food stability. Approximately 42 percent of the households in Florida have vegetable gardens. These gardens produce nearly 40 percent of the vegetables we now eat (the average U.S. garden in 1979 produced 545 pounds of vegetables). If each of these 1.57 million

gardens produced 883 pounds of vegetables, all of Florida's fresh vegetable needs could be provided.[107] Should a bulk of Florida's commercial vegetable production switch to other crops or be pushed out of business by development pressures, these figures show the significant contribution home gardens can make to a state's food supply, self-reliance, and economy. Furthermore, home canning and freezing would decrease the dependence on processed foods that are now shipped into Florida. Even urban gardens can make a significant contribution to the food supply, whether they are in community lots, patio containers, windowboxes, rooftops or backyards. The Florida Community Gardening Pilot Program of 1980 provides permits for residents of specified counties to use vacant public land for gardening. Such a program is a step in the right direction.

Recommendations--The State

A. PRESERVATION OF FARMLAND

1. The Greenbelt Law now provides for tax assessment of farmland on the basis of agricultural value rather than market value. Revisions are needed, however, to recapture taxes on land that is held for investment rather than for agricultural production.

2. Institute a Capital Gains Tax like that in Vermont, where short term owners of agricultural land must pay up to 60 percent of the difference between the original payment and the selling price of the land.

3. Combine land use provisions with tax relief. For instance, the Farmland Preservation Act of 1977 in Wisconsin grants contracts to farmers to keep their land in agricultural use for five years in exchange for income tax credits. With the state's "Circuit breaker" tax, a farmer's total tax load is reduced when property taxes exceed a certain percentage of his total income.

4. Designate Class I and II lands be used for agricultural use only.

5. Implement a heavy tax on profits made on the development of former agricultural land.

6. Continue to enforce the state's Right to Farm Law.

7. Develop a procedure that allows the state "first refusal" rights to agricultural land being sold. In France, farmland owners who have intentions of selling their land must notify a non-profit corporation, that has the right to buy the land and sell it to another farmer.

8. Employ agricultural zoning, but in a way that does not promote low density residential areas. In Pennsylvania, Maryland, and California some local governments enforce Exclusive Farm Use Zoning which requires that large minimum lots of 20 to 30 acres be used only for farm related operations.

9. Expand the State Comprehensive Planning Act of 1972 to implement legislation against leapfrog development.

10. Establish agricultural districts to protect farmland from urban expansion.

B. REGIONALIZE FOOD SUPPLY

1. Provide tax incentives for small scale food producers--such as not taxing the first $10,000 of income from food produced for local production.

2. Set up various support programs to promote a diversified agriculture.

3. Develop incentives to enter farming, such as state loans with deferred or reduced payment until five years after start-up. States could also provide technical, managerial, and organizational assistance for new farmers.

4. Establish demonstration experiments to test crop, animal, and fish varieties suited to the state's soil and climate, and develop and test low input, sustainable farming techniques suitable to the state.

5. Mandate a study by the State Department of Agriculture and the state land grant university of the potential for producing the various crops needed in the state.

6. Issue state tax credits for home production, processing, and storing of food.

C. EXPAND LOCAL MARKETS

1. Give preference to in-state producers in bidding for the sale of foods to state-run institutions.

2. Provide incentives for farmers to operate roadside stands and "pick-your-own" operations.

3. Develop an extensive program promoting and advertising state-grown products for in-state consumption.

4. Establish more farmers markets, especially in urban areas, and set up wholesale farmers markets to supply retailers, co-ops and other volume purchasers.

5. Encourage the development of more processing plants and provide assistance to these plants that purchase local products.

6. Provide assistance to small growers through a statewide marketing clearinghouse.

D. STOP EROSION

1. Establish penalties for erosion damage such as prohibiting all agricultural production activities which result in more than five tons of soil loss per acre per year--the maximum rate at which the soil's fertility can be maintained.

2. Establish rewards for soil enrichment, such as tax credits for on-farm soil and water conservation programs.

3. Provide additional state funds for the completion of the statewide soil survey.

4. Monitor the success of Florida's non-regulatory Agricultural 208 program, which encourages farmers to prepare and submit a conservation plan that includes"best management practices." The program also provides an educational program for agricultural landowners through the Cooperative Extension Service. Consideration should be given to making conservation plans mandatory.

5. Institute and enforce a "severance tax" on soil losses due to excessive erosion. Tax revenues from farms permitting rapid erosion could be used to finance subsidies to encourage conservation practices, and to pay for downstream dredging of silt, damage to water treatment facilities and other social costs.

6. Develop tax incentives for soil conserving measures, such as investing in no-tillage equipment. According to the USDA, practicing just minimum tillage techinques on 80 percent of all U.S. cropland would reduce soil erosion by 50 percent or more.

7. Link economic programs--such as loans, crop insurance, disaster relief, and state purchase of farm commodities--to avoidance of excessive soil erosion.

8. Develop incentives for encouraging the use of rental arrangements, which include provisions for sharing erosion control and soil enrichment costs with landowners.

9. Offer "conservation achievement contracts" whereby farmers would be provided with annual payments determined by the amount of reduced erosion achieved.

10. Use public subsidies, such as low interest loans, preferential farm property tax evaluations and other tax incentives to encourage regional organic waste recycling, cover and permanent cropping, minimum tillage, proper rotation, biological nitrogen fixation, contour plowing, terracing, stripcropping, leaving harvest residues on soil surfaces, reducing soil compaction and salinity, and intercropping.

E. DEVELOP ON-FARM RENEWABLE ENERGY SOURCES

To switch the energy base of the U.S. food system from non-renewable to renewable energy will be expensive, but to continue to run the food system almost entirely on fossil fuels as we are now doing will be even more expensive. For example, to produce the amount of energy currently consumed by the U.S. food system with present solar energy technology would cost about $500 billion. But once the system was switched over to renewable energy, the annual costs for fuel would be greatly reduced, and the annual costs for imported oil (a major driving force behind inflation) would be eliminated.

Florida can help with this transition from depletable to renewable energy sources with various approaches:

1. Conduct regional inventories of all renewable energy sources.

2. Provide incentives, such as tax credits for investments made in agricultural energy conservation and on-site development of renewable energy sources; or low-interest loans for accomplishing the same; or tax exemptions for income received from the production of renewable energy.

3. Set up pilot projects and demonstration sites using alternative forms of energy for various types of farms, and showing recycling and the use of sludge.

The Land Grant College

In 1978, the University of Florida developed a low energy technology (LET) research program.[108] This program recognized Florida's dependence on cheap energy and the necessity to increase energy efficiency in production, transportation, harvesting, processing, and marketing. Directly, the researchers hope to develop alternate, less energy-consuming methods for 1) on-farm transportation, 2) pumping water, 3) harvesting, processing, and marketing, and 4) applying fertilizers and pesticides.

Indirect approaches to reduce energy consumption include 1) plant and animal genetic selections that are more efficient in converting nutrients into biomass, 2) more widespread use of resistance and biological controls, and 3) conversion of agricultural wastes to energy sources such as methane.

The following accomplishments of the University's Extension Program are worth noting for their contribution to reducing energy farm use:

a. Completed multiple cropping and minimum tillage demonstrations in at least six counties.

b. Developed forage management programs that included use of legumes to replace nitrogen fertilizer.

c. Developed a Farm System Laboratory that provides producers, policy makers, and agricultural experts a computerized source of input-output data for all of the major commodities in the state. The lab also estimates total energy requirements of Florida's agriculture under alternative energy systems.

d. Tested alternatives to petroleum energy including a wood burning truck (wood gasification) that has run 7,000 miles, a methane collector using swine waste, and a solar grain drying unit supplemented with propane gas.

e. Established a Center for Bio-Mass Energy. Estimates indicate that marine water lying off the coasts of Florida have the potential for abundant biomass production.

F. CONSERVE WATER

1. Price water to accurately reflect its actual cost and need.

2. Provide investment incentives for drip irrigation and other water conservation equipment.

3. Provide tax credits for those who install water-saving devices in their homes.

G. RECYCLE ORGANIC WASTES

1. Prepare a state-wide inventory of the types and amounts of organic wastes available now and in the future and assess the ability of these wastes to improve soil fertility and tilth.

2. Establish an Agricultural Waste Council in the State Department of Agriculture to develop desirable legislation and other measures to facilitate recycling of wastes.

3. Develop incentives for using local organic wastes for fertilizer and incentives to industry to separate toxic substances from their wastes so that it might be more safely used on cropland.

H. DEVELOP IN-STATE FOOD PROCESSING

1. Provide incentives to attract food processors that can meet the needs of producers and consumers and enhance the local economy.

2. Provide incentives for on-farm processing, cooling, and fresh packing of local food crops.

3. Help establish community food processing and storage facilities for the use of families and small community food producers. In this way, economies in equipment and energy consumption can be realized.

I. DEVELOP LONG-RANGE FOOD SYSTEM PLANS

1. Develop an overall state food policy which will increase regional self-reliance and economic viability while decreasing the vulnerability of the state's food supply.

2. Develop an emergency food plan to deal with a food supply disruption. This might provide for regional grain storage facilities and the formation of state-wide communication and coordination centers.

3. Conduct an annual study of the condition of the state food system that will illustrate the amount of food currently being imported and exported, the amount of land lost to development, soil erosion losses, and what measures need to be taken to increase the state's self-reliance.

J. INITIATE EDUCATION PROGRAMS

1. Develop consumer education programs to increase awareness of locally-grown produce.

2. Initiate educational programs on farmland preservation, farm energy conservation, reduced pesticide and fertilizer use, recycling of organic wastes, and energy expenditures in different methods of farming and home food production and preparation.

3. Promote nutrition education campaigns to illustrate the relationships between diet and health, and the benefits of fresh, seasonal, locally-grown and minimally processed foods, as well as bulk purchasing of food.

4. Communicate the goals and the condition of the state's food system as revealed in an annual study. (see I-3)

K. REVITALIZE FISHING INDUSTRY

1. Develop more direct marketing systems, including inland market options for surpluses.

2. Participate with other states and the Federal Government in keeping annual harvests below best estimates of maximum sustainable yield for all species.

3. Enact and enforce stricter laws regulating dumping of pollutants in marine waters.

4. Provide investment incentives for aquaculture within the state.

5. Implement a limited entry program that regulates fleet size in the shrimp industry to allow for increased production per vessel, reduced costs, and increased profits.

L. ENHANCE CONSUMER AND ENVIRONMENTAL SAFETY

1. Strictly enforce existing environmental protection laws.

2. Develop stricter standards for pesticide residues in foods and for proper labeling of products.

3. Continue to support the Florida's Pesticide Enforcement Grant Program that was initiated in 1979.

M. REDUCE DEPENDENCE ON TRUCK TRANSPORTATION

1. Reactivate the rail service in a way that employs piggyback and roadrailer forms. Florida now has numerous rail innovations on trial bases including the Road-Railer, the Truk-Train, the Four-Runner, and the Six-Pac.

2. Utilize water transportation for the major East Coast markets.

3. Improve truck back-haul efficiency.

4. Upgrade physical facilities at state farmers markets.

Recommendations—Counties and Cities

A. PRESERVE FARMLAND

1. Establish land-use management committees to make policy recommendations dealing with urban growth while preserving farmland. A Growth Management Committee now exists in Orange County.

2. Establish urban block farms that include housing units with areas set aside for farming, greenhouses, food storage, food preservation, recycling, etc.

3. Develop and adhere to land use plans as described under the Local Government Comprehensive Planning Act of 1975.

4. Adopt a Transfer of Development Rights program such as those implemented in Collier, Lee, and Palm Beach Counties, where landowners in agricultural retention areas can sell their development rights to landowners in developed areas. This allows developed areas to exceed previously set density limits within prescribed limits. TDR programs are best suited for actively developing areas.

5. Create agricultural open space preserves adjacent to a city's boundaries that preserve remaining prime farmland for agricultural use. Such designated areas fall under the Comprehensive Development Master Plan for Metropolitan Dade County.

6. Implement agricultural zoning as is currently used in Broward, Charlotte, Hillsborough, and Citrus Counties.

B. DEVELOP AND ENCOURAGE LOCAL FOOD PRODUCTION

1. Make publicly-owned lands that are suitable for food production available for community gardens.

2. Provide local tax incentives for home/community produced food.

3. Continue to support the Florida Community Gardening Pilot Program of 1980 facilitating long-term leasing of vacant lots to community groups for urban gardening and providing basic site improvement.

4. Subsidize gardens, or give start-up funds to establish gardens and/or greenhouses, in schools, prisons, hospitals, and nursing homes.

5. Establish community farms on their urban fringes to be worked by local farmers.

6. Encourage city agencies, as well as consumer groups, senior citizens and day care centers, hospitals, schools, and prisons to purchase food directly from local farmers and processors.

7. Promote contract growing (as practiced in Japan) whereby groups of urban families, or co-ops, or even the city itself, arranges to buy food directly from a local supplier.

8. Establish large-scale composting operations (such as the Bronx Frontier Development Corporation compost project in New York City) to turn vegetable, manure, and other organic wastes into compost for urban gardens.

C. DEVELOP AND ENCOURAGE LOCAL MARKETS

1. Encourage and assist the establishment of farmers markets, particularly in low-income neighborhoods, and facilitate authorizations for farmers to accept food stamps at the markets.

2. Help establish mobile farmers markets and fish markets to visit housing projects, neighborhood centers, apartment complexes and factories.

3. Assist the formation of buying clubs, food cooperatives, co-op stores, and preservation/storage centers.

D. DEVELOP AND ENCOURAGE LOCAL FOOD PROCESSING AND STORAGE

1. Sponsor community canning facilities where residents can preserve food inexpensively or free of charge.

2. Provide incentives to grocery stores to establish canning facilities for their shoppers.

E. FACILITATE ACCESS TO FOOD

1. Facilitate access to food stamps, emergency food outlets, and elderly feeding programs for those in need of these services.

2. Provide transportation to farmers markets and "pick-your-own" operations.

F. EDUCATE PEOPLE ABOUT THEIR FOOD SITUATION

1. Organize public meeting and /or educational programs explaining the importance of agriculture to urban areas, as well as offering classes in urban agriculture, aquaculture, container and rooftop gardening, food preservation, storage, and preparation, and nutrition. Wise food selection based on locally-produced foods should be taught in all classes.

2. Encourage public schools to include classes on local/urban agriculture.

Recommendations--Consumers

1. Purchase fresh, locally-grown fruits and vegetables at roadside stands, "pick-your-own" operations, and farmers/fish markets.

2. Grow more fruits and vegetables in home gardens.

3. Process and preserve home-grown or locally-produced food.

4. Join food co-ops or buying clubs that contract with regional farmers.

5. Try raising backyard animals like rabbits, chickens, or fish. Fish gardening in a backyard or basement pool can provide a family with up to 100 pounds of fish in a single growing season. Fish, chicken, and rabbits are all efficient converters of feed into meat and protein.

Recommendations--Producers

1. Explore direct marketing channels such as roadside stands, "pick-your-own" operations, and farmers markets.

2. Support a marketing system that would provide information necessary for decision making and identification of market alternatives.

3. Support regional warehouses and storage facilities that would grade, pack, and distribute the output of small local producers.

4. Explore the many marketing strategies: forward deliverable contract markets, exclusive agency bargaining, vertical integration through ownership, joint ventures between agricultural cooperatives and agribusiness marketing firms, marketing orders, and marketing boards.

5. Apply to the local soil conservation district for help in developing or updating a soil and water conservation management program.

6. Cut inputs by using better management practices, such as cropping systems that reduce the need for chemical fertilizers and pesticides.

7. Work for a change in those grading and marketing standards that are now outmoded. For instance, grass-fed cattle could greatly enhance Florida's meat production, but this meat won't grade "choice" according to current standards.

8. Start growing more of your own fertilizer in the form of nitrogen-fixing legumes and green manure crops. Use crop rotations that reduce the amount of herbicides needed, and biological controls to replace or reduce pesticide use.

9. Form marketing co-ops that could sell large quantities of food to organizations such as restaurants, schools, and other institutions.

Conclusion

Putting the most appropriate of these measures into practice could greatly increase Florida's food self-reliance and economic viability. Such changes also decrease our vulnerability in times of nutritional and international economic stress, and make Florida's food system more sustainable. The problems afflicting our food system are real, and they are growing each day. But there are solutions, and we still have the time to make changes. Without changes, the system will crash. With careful planning and action, the abundance we have historically known in Florida could continue. If Florida is truly concerned about the condition and future of its food system, then the state must be willing to spend the time and money to develop a realistic plan of action, and then to spend even more time and money to see this plan modified, accepted and implemented. The time to begin is now.

Footnotes

1. Business Briefs of Florida's Agribusiness Sector (Lakeland: Agribusiness Institute of Florida, Inc., 1981); Florida Co-operative Extension Service, Agronomy Facts, NO. 105 (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1980), p. 1.

2. U.S. Department of Agriculture, Agricultural Statistics 1980 (Washington, D.C.: Government Printing Office, 1981); Joint Center for Environmental and Urban Problems, The Future of Florida's Agricultural Industry: A Discussion Paper (Fort Lauderdale: Florida Atlantic University, 1981).

3. Florida Agribusiness (Lakeland: Agribusiness Institute of Florida,Inc., 1982).

4. Business Briefs of Florida's Agribusiness Sector, p. 1.

5. "Farm Front," Florida Market Bulletin of the Florida Department of Agriculture and Consumer Services, 15 September 1980.

6. Rodale Press, comp., Florida Food Imports Chart (Emmaus: Rodale Press, 1982).

7. Rodale Press, comp., Florida Food Imports Chart.

8. "Developing Florida," Saturday Review, May 1980, pp.30-31.

9. Ike Flores, "Can Florida's Second Industry Survive?" Fort Lauderdale News and Sun Sentinal, 12 August 1979, p. F-1, cols. 1-3.

10. U.S. Department of Commerce Bureau of the Census, 1978 Census of Agriculture, part 9 (Washington, D.C.: GPO, 1981), p.2.

11. John E. Davies, Occupational and Environmental Pesticide Study in South Florida (Research Triangle Park: U.S. Environmental Protection Agency, 1977).

12. Office of the Comptroller General, Phosphates: A Case Study of a Valuable, Depleting Mineral in America (Washington, D.C.: GPO, 1979).

13. R.D. Woodson et.al., Local Control Over the Onshore Impacts of Offshore Energy Development in Florida (Gainesville: University of Florida Center for Governmental Responsibility, 1979), p.1.

14. R.D. Woodson et.al, p. 2.

15. The Feasibility of a Large Central Beef Cattle Feeding Facility for IFAS, (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1980), p. 12.

16. Florida Cash Receipts From Farming (Orlando: Florida Crop and Livestock Reporting Board, 1981), pp. 1-2; Business Briefs of Florida's Agribusiness Sector.

17. U.S. Department of Agriculture, Agricultural Statistics 1980.

18. U.S. Department of Agriculture, Agricultural Statistics 1980.

19. Florida Cash Reciepts From Farming, p. 2.

20. Rodale Press, comp., Florida Food Imports Chart.

21. Rodale Press, comp., Florida Food Imports Chart.

22. "Developing Florida", p. 31.

23. Nancy E. Stroud, ed., The Farm and the City in the Southeast: Problems and Solutions to the Urban Conversion of Farmland (Fort Lauderdale: FAU/FIU Joint Center for Environmental and Urban Problems, 1980), p. 2.

24. Statements made by Jack Campbell, Executive Director, Dade County Agricultural Coalition, Florida City, Florida, May 1979.

25. George DeVault,"South Florida Land Boom Threatens U.S. Supply of Winter Produce," Fort Lauderdale News and Sun Sentinel, 29 May 1979, pp. B1, B4.

26. Florida House of Representatives Committe on Agriculture and General Legislation, Legislative Staff Report-Agricultural Lands in Florida (Tallahassee: n.p., 1981), p. 33.

27. George DeVault, "$1,000 an Acre Seemed a Dream in the Early 1930's," South Palm Beach Sun Sentinal, 1 October 1979, p. 8A, col. 1-4.

28. George DeVault, "Not Much Farmers Can Do As Development Moves In On Their Land," South Palm Beach Sun Sentinal, 1 October 1979.

29. U.S. Department of Commerce Bureau of the Census, 1978 Census of Agriculture, Part 9.

30. Florida House of Representatives, Agriculture Lands in Florida, p. 18.

31. U.S. Department of Commerce Bureau of the Census, 1978 Census of Agriculture, Part 9.

32. "Bigger Not Necessarily Better," Small Farm Advocate, Fall 1981, p. 10.

33. U.S. Department of Agriculture, 1977 National Resources Inventory (Washington, D.C.: Soil Conservation Service, 1980), Tables 16, 17.

34. U.S. Department of Agriculture, 1980 Appraisal Part I, Soil, Water, and Related Resources in the United States: Status, Condition, and Trends (Washington, D.C.: GPO, 1981), p. 82.

35. U.S. Department of Agriculture, 1977 National Resources Inventory, Table 16.

36. Calculation based on: area of Fort Lauderdale is 29.6 square miles; 160 tons of soil will cover one acre to a depth of one inch; total amount of soil eroded in Florida in one year is 16,623,000 tons.

37. W.E. Larson, "Protecting the Soil Resource Base," Journal of Soil and Water Conservation, 36, No. 1 (1981), pp. 13-16.

38. Calculation based on loss of 8,657.81 acre/feet of soil due to erosion each year.

39. U.S. Department of Agriculture Crop Reporting Board, Commerical Fertilizers Consumption For Year Ended June 30, 1981 (Washington, D.C.: USDA, 1981), pp. 16 and 18; U.S. Department of Agriculture Crop Reporting Board, Agricultural Prices 1980 (Washington, D.C.: USDA, 1981), pp. 128-134.

40. Ike Flores, p. F-1.

41. Office of the Comptroller General, Phosphates: A Case Study.

42. U.S. Department of the Interior Bureau of Mines, A Supply-Demand Analysis of the U.S. Phosphate Industry (Washington, D.C.: GPO, 1981), pp. 3,5.

43. Perry L. Adkisson, "The Approaching Crisis in Sustaining High-Yielding Agricultural Systems," Plant Disease, 65, No. 12 (1981), p. 940.

44. U.S. Department of Agriculture Crop Reporting Board, Commercial Fertilizers Consumption, p. 9.

45. Forrest E. Stegelin, "Agricultural Transportation Issues for Florida Perishables in the 1980's," Florida Food and Resource Economics of the University of Florida, No. 39 (1981), p. 1.

46. Stegelin, pp. 1,3.

47. Stegelin, p. 2.

48. Agriculture In Transition, Proceedings of a Conference on Agriculture in Transition (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1980).

49. Stegelin, p. 2.

50. Florida Department of Agriculture, Florida Cash Receipts from Farming.

51. Rodale Press, comp., Florida Food Imports Chart.

52. George DeVault, "U.S. Resists Florida Farmers in Tomato 'War'," South Palm Beach Sun Sentinel, 23 February 1979, pp. 1A, 11A.

53. Robert Metz, "Orange Groves and the Future," The New York Times, 22 January 1982.

54. Telephone interview with Dr. Daniel Tilley, Florida Department of Citrus, University of Florida, December 1981.

55. Metz, "Orange Groves".

56. Florida House of Representatives, Agricultural Lands in Florida, p. 20.

57. "Frozen Concentrates," The Food Institute's Report on Food Markets, 30 January 1982, p. 9.

58. "Florida Citrus Crop Hurt By Low Temperatures," The New York Times, 12 January 1982.

59. Tom Nicholson and Andrew Jaffe, "Florida Grits and Bears It," Newsweek, 7 February 1977.

60. Nightline, American Broadcasting Company, 10 January 1982.

61. "Acid Precipitation and Sulfate Deposition in Florida," Science, 30 May 1980, p. 1027.

62. Robert J. Livingston, "Acid Rain Over Florida," Geojourney, October 1980, pp. 10,11.

63. "35 Percent of Florida Down the Drain?" Environmental Journal, March 1977.

64. William R. Barada, "Groundwater: Our Most Precious Renewable Resource," ENFO of the Florida Conservation Foundation, October 1981, pp. 1-3.

65. Barada, p. 3.

66. Henry F. Swanson, Know Your Water "R's" (Orlando: Orange County Agricultural Center, 1977), p. 1.

67. Henry F. Swanson, "Where Did the Rains Go and Why?" Xerox, n.d., p. 3.

68. Swanson, "Where Did the Rains Go and Why?," p. 2.

69. Kenneth Broner, "The Ungreening," Omni, December 1980, p. 69.

70. Charlie Jean, "It's Dry Reckoning for Florida's Water Supply," Sentinal Star, 11 January 1982, p. 2-C.

71. Bill Hutchinson, "New Florida Running on Empty," New Florida Special Report, 1, No. 4 (1981).

72. U.S. Department of Commerce Bureau of the Census, 1978 Census of Agriculture, Part 9, p. 131.

73. Jean, p. 2-C.

74. U.S. Department of Agriculture, 1980 Appraisal Part II, Soil, Water, and Related Resources in the United States: Status, Condition, and Trends (Washington, D.C.: GPO, 1981), p. 99.

75. Telephone interview with J.M. Meyers, Professor of Agricultural Engineering and Water Management, University of Florida, January 1982; George Alexander, "Running on Empty?," National Wildlife, 20, No. 1 (1982).

76. Ken Wells, "Farmland Melting Away," Miami Herald, 21 October 1979, pp. 1B, 7B.

77. Barada, p. 5.

78. Hutchinson, p. 5.

79. U.S. Department of Commerce, Florida Landings by Districts 1979, Xerox, n.p.

80. Fred J. Prochaska and James C. Cato, Economic Conditions in the Gulf of Mexico Shrimp Industry: 1960-1981 (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1981), p.1.

81. Robert J. Livingston, et.al., A System for the Determination of Chronic Effects of Pollutants on the Physiology and Behavior of Marine Organisms (Gainesville: University of Florida Marine Advisory Program, 1974), p. 1.

82. "Assessment of Fishery Habitat Loss, Use of a Coastal Geographic Digital Base and Establishment of a Geographic Information System" (n.p.: Florida Department of Natural Resources, n.d.), p. 1.

83. Dr. Richard Lipsey, Florida Statewide Pesticide Use Survey (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1981), p. 14.

84. George DeVault, "No Place Safe From Pesticides," Fort Lauderdale News and Sun Sentinel, 15 March 1981.

85. J.E. Davies, Department of Chemistry, Florida State University, "Pesticide Residues in Man," p. 313.

86. George DeVault, "South Florida Awash in Pesticides," Fort Lauderdale News and Sun Sentinel, 15 March 1981.

87. Ralph C. Dougherty, et. al. "Sperm Density and Toxic Substance: A Potential Key to Environmental Health Hazards," in Environmental Health Chemistry-The Chemistry of Environmental Agents as Potential Human Hazards, ed. J.D. McKinney (Ann Arbor: Ann Arbor Science Publishers, Inc., 1980.

88. DeVault, "South Florida Awash in Pesticides."

89. DeVault, "South Florida Awash in Pesticides."

90. J.E. Davies, et. al., "The Pesticide Problems of the Agricultural Worker," (Miami: Environmental Protection Agency, n.d.).

91 U.S. Department of Commerce Bureau of the Census, 1978 Census of Agriculture, Part 9.

92. Rodale Press, comp., Florida Food Imports Chart.

93. Rodale Press, comp., Florida Food Imports Chart.

94. Rodale Press, comp., Florida Food Imports Chart.

95. The Feasibility of a Large Central Beef Cattle Feeding Facility, pp. 2,4.

96. The Feasibility of a Large Central Beef Cattle Feeding Facility, p. 16.

97. James R. Simpson and F. S. Baker Jr., Structural and Operational Characteristics of the Florida Cattle Feeding Industry, Circular No. 493 (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1981), p. ii.

98. U.S. Department of Agriculture, 1980 Appraisal, Part I, p. 273.

99. Donald L. Van Dyne and Conrad B. Gilbertson, Estimating U.S. Livestock and Poultry Manure and Nutrient Production (Springfield, VA: National Technical Information Service, 1978); Michael W. M. Berrick, ed., Handbook of Organic Waste Conversion (New York: Van Nostrand Reinhold Company, 1980). Calculations based on 2,635,529,000 lbs. dry weight of economically recoverable manure.

100. Hutchinson, p. 5.

101. Noreen N. Koga, Water Conservation in the Home (San Francisco: U.S. Department of Energy, 1981), n.p.

102. Koga, Water Conservation In the Home.

103. Alexander, "Running on Empty?"

104. Jeff Klein, California Food System Study, TS, Rodale Press, Emmaus PA 18049

105. Julia F. Morton and George Snyder, "Aquatic Crops versus Organic Soil Subsidence"; Proceedings of the Florida State Horticultural Society, 89 (1976), 125-129.

106. Robert L. Degner, et. al., Farmer to Consumer Direct Marketing of Blueberries in Florida (Gainesville: University of Florida Institute of Food and Agricultural Sciences, 1981), pp. 27-28.

107. The Gallup Organization, Inc., 1980 National Gardening Survey (Burlington: Gardens for All, 1980), p. 28.

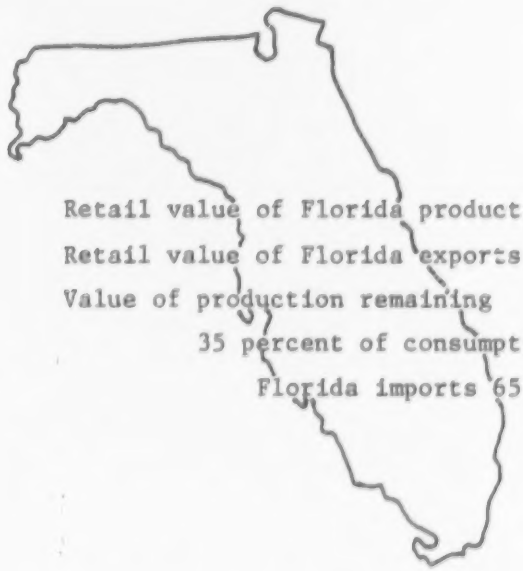
108. Agriculture In Transition.

APPENDIX

FLORIDA FOOD IMPORTS

Everyone is familiar with the bounty of Florida, the sunshine state. This state grows 70 percent of all citrus fruits and 19 percent of all sugar produced in the United States. Florida ranks second only to California in vegetable production, and is the top domestic producer of winter vegetables in the eastern United States. However, this agricultural bounty hides some very serious problems in Florida's agriculture. Sixty-five percent of the food consumed in Florida is exported from other states. Each year, $250 million is spent on transporting food into the state.

However, Florida has the potential to expand its food system. Rather than exporting fresh fruits and vegetables and importing processed fruits and vegetables, as is currently done, canning and freezing companies should open facilities in Florida. In-state beef production could be expanded by the use of forage feeding programs, instead of feeding cattle grains that are often imported from other states. These and many other steps can be taken to provide Floridians with a safe, secure, efficient, and economical food system.



Retail value of Florida production	9,251,177.59
Retail value of Florida exports	5,980,365.80
Value of production remaining	3,270,811.79

35 percent of consumption produced in Florida

Florida imports 65 percent of its food.

FLORIDA FOOD IMPORTS

COMMODITY	PRODUCTION Retail Weight[a] (1,000 lbs)	PRODUCTION Retail Value[b] ($1,000) (1980 dollars)	CONSUMPTION Retail Weight[c] (1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Area Required to produce 100% of FL Consumption[d]
Meats									
Beef	110,048.02	256,411.89	745,110.00	1,736,106.30	85.2	1,479,162.57			4,649,486.40
Veal	10,603.59	32,553.02	14,610.00	44,852.70	27.4	12,289.64			e
Lamb and Mutton	14.45	36.12	12,662.00	31,655.00	99.9	31,623.35			6,590.73
Pork	22,291.95	28,979.54	665,242.00	864,814.60	96.6	835,410.90			1,178,794.20
Poultry									
Broilers	251,101.44	185,815.07	487,0[illegible].00	360,380.00	48.4	174,423.92			698,001.92
Turkey	Insignificant		102,2[illegible].00	96,133.80	100.0	96,133.80			131,150.89
Eggs	397,410.00	218,575.50	337,00[illegible].00	185,352.20			15.2	33,223.48	371,863.85
Fish[f]									
Blue Crabs	6,615.37	16,670.73	NC						
Lobster, Spiny	3,500.73	9,031.88	NC						
Oysters	2,792.82	13,992.03	NC						
Scallops	548.75	3,067.51	NC						
Shrimp	17,459.40	77,170.55	NC						
Total Shellfish (Includes shell fish not listed)	32,865.10	128,831.19	29,220.00	114,542.40			11.1	14,300.26	
Mackerel	7,121.70	17,946.68	NC						
Mullet, Black	15,390.12	9,541.87	NC						
Sardines	1,615.36	5,169.15	2,922.00	9,350.40	44.7	4,179.63			
Tuna	28.90	100.86	28,246.00	98,578.54	100.0	98,578.54			
Total Finfish (Includes fish not listed)	43,634.15	114,321.47	52,596.00	137,801.52	17.0	23,426.26			

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FLORIDA FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Retail Weight (1,000 lbs)	PRODUCTION Retail Value ($1,000) (1980 dollars)	CONSUMPTION Retail Weight (1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	to produce 100% of Fl. Consumption
Dairy Products									
Fluid milk	1,886,040.00	565,812.00	2,220,720.00	666,216.00	15.1	100,598.62			847,693.30[g]
Butter	0.00	0.00	42,856.00	86,140.56	100.0	86,140.56			354,103.75
Cheese	0.00	0.00	171,424.00	371,990.08	100.0	371,990.08			516,362.00
Condensed & Evaporated Milk	0.00	0.00	69,154.00	39,417.78	100.0	39,417.78			57.642.20
Cottage Cheese	6,970.00[h]	5,854.80	43,830.00	36,817.20	84.1	30,963.27			18,934.30
Dry Whole & Nonfat Milk	0.00	0.00	34,090.00	68,861.80	100.0	68,861.80			32,736.55
Frozen Products	211,760.00	196,936.80	250,318.00	232,795.74	15.4	35,850.54			219,226.70
Vegetables, Fresh									
Artichokes	NA		2,922.00	1,314.90	100.0	1,314.90			NA
Asparagus	NA		2,922.00	7,889.40	100.0	7,889.40			NA
Broccoli	insignificant		16,558.00	16,392.42	100.0	16,392.42			1,971.19
Cabbage	353,409.30	106,022.79	81,816.00	24,544.80			76.8	81,425.50	3,400.22
Carrots	NC		59,414.00	24,953.88					1,980.47
Cauliflower	NC		12,662.00	12,662.00					937.93
Celery	458,118.00	201,571.92	71,102.00	31,284.88			84.5	170,328.27	1,760.82
Cucumbers	205,233.60	96,459.79	38,960.00	18,311.20			81.0	78,132.43	2,529.87
Eggplant	49,866.30	22,439.84	4,870.00	2,191.50			90.2	20,240.73	245.96
Escarole	70,401.00	95,041.35	5,844.00	7,889.40			91.7	87,152.92	485.99
Garlic	insignificant		7,792.00	24,622.72	100.0	24,622.72			599.38
Green Peppers	164,588.00	158,004.48	32,142.00	30,856.32			80.5	127,193.61	3,105.51
Lettuce	249,984.00	122,492.16	242,526.00	118,837.74			3.0	3,674.76	12,566.11

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FLORIDA FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Retail Weight (1,000 lbs)	PRODUCTION Retail Value ($1,000) (1980 dollars	CONSUMPTION Retail Weight (1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Area Required to produce 100% of FL Consumption
Onions	insignificant		99,348.00	31,791.36	100.0	31,791.36			4,967.40
Peas, English	insignificant								
Potatoes, white	178,214.40[1]	40,989.31	480,182.00	110,441.86	62.9	69,467.93			24,751.65
Potatoes, sweet	insignificant		33,116.00	9,272.48	100.0	9,272.48			2,879.65
Radishes	105,105.00	86,186.10	NC						
Snap beans	117,678.60	81,198.23	12,662.00	3,736.78			89.2	72,428.82	4,742.40
Spinach	insignificant		6,818.00	12,681.48	100.0	12,681.48			1,704.50
Sweet Corn	431,106.48	176,753.66	64,284.00	26,356.44			85.1	150,417.36	7,118.94
Tomatoes	987,946.50	671,803.62	110,036.00	74,824.48			88.9	596,561.61	4,031.81
Vegetables, Frozen									
Asparagus	NC		584.40	1,893.46					HA
Broccoli	NC		13,636.00	13,499.64					2,159.00
Brussel Sprouts	NC		2,425.00	1,753.20					HA
Carrots	NC		9,058.20	6,431.32					503.03
Cauliflower	NC		4,480.40	4,480.40					474.59
Lima beans	NC		4,577.80	4,760.91					953.71
Onions	NC		6,623.20	5,099.86					264.93
Peas, English	NC		14,999.60	11,249.70					5,434.86
Potatoes	NC		164,606.00	111,932.08					18,836.36
Snap beans	NC		9,740.00	7,402.40					3,354.89

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FLORIDA FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Retail Weight (1,000 lbs)	PRODUCTION Retail Value ($1,000) (1980 dollars)	CONSUMPTION Retail Weight (1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Area Required to produce 100% of FL Consumption
Vegetables, frozen (con't)									
Spinach	NC		7,305.00	4,821.30					1,826.25
Sweet corn	NC		18,798.20	14,474.61					7,702.39
Vegetables, canned									
Asparagus	NC		2,922.00	5,434.92					NA
Beets	NC		11,688.00	3,506.40					526.45
Carrots	NC		4,870.00	1,899.30					216.39
Lima beans	NC		2,922.00	1,461.00					304.38
Peas English	NC		32,142.00	10,928.28					7,917.65
Pickles	NC		67,206.00	49,732.44					6,269.75
Potatoes, white	NC		12,662.00	3,798.60					1,026.01
Potatoes, sweet	NC		9,740.00	6,915.40					1,094.27
Sauerkraut	NC		11,688.00	3,740.16					903.00
Snap beans	NC		60,388.00	24,759.08					11,110.14
Spinach	NC		4,870.00	2,191.50					1,096.97
Squash /pumpkin	NC		3,896.00	1,597.36					1,444.74
Sweet corn	NC		56,492.00	23,726.64					15,877.82
Tomato catsup, paste, etc	NC		117,854.00	71,890.94					595,993.72
Tomato puree	NC		9,740.00	4,090.80					40,545.87
Tomato juice	NC		29,297.92	6,445.54					57,356.31
Tomatoes, whole	NC		59,414.00	25,548.02					118,294.79

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FLORIDA FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Retail Weight (1,000 lbs)	PRODUCTION Retail Value ($1,000) (1980 dollars)	CONSUMPTION Retail Weight (1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	Area Required to produce 100% of Fl. Consumption
Fruit, fresh									
Apples	0.00	0.00	155,840.00	99,737.60	100.0	99,737.60			NA
Avocados	48,880.00[k]	97,760.00	7,792.00	15,584.00			84.1	82,216.16	1,198.77
Bananas	0.00	0.00	202,592.00	68,881.28	100.0	68,881.28			
Cantaloupes	NC		64,284.00	28,284.96					11,893.43
Cherries	0.00	0.00	5,844.00	7,071.24	100.0	7,071.24			NA
Grapefruit	1,607,857.45	659,221.55	75,972.00	31,148.52			95.3	628,238.14	2,059.42
Grapes, European	0.00	0.00	35,064.00	37,869.12	100.0	37,869.12			Na
Grapes, Muscadine	2,400.00[l]	1,704.00	NC						
Honey Tangerines	131,181.70	38,042.69	NC						
Lemons	108,000.00	85,320.00	18,506.00	14,619.74			82.9	70,730.28	790.85
Limes	47,272.00	55,780.96	3,896.00	4,597.28			91.8	51,206.92	208.12
Oranges, Round	959,427.00	470,119.23	148,048.00	72,543.52			84.6	397,720.87	4,594.91
Peaches	56,400.00[m]	31,020.00	52,596.00	28,927.80			6.7	2,078.34	5,259.60
Pears	0.00	0.00	23,376.00	13,324.32	100.0	13,324.32			NA
Pineapples	insignificant		13,636.00	7,090.72	100.0	7,090.72			
Plums, Prunes	0.00	0.00	14,610.00	17,093.70	100.0	17,093.70			1,461.00
Strawberries	4,370.00	7,909.70	16,558.00	29,969.98	73.60	22,057.91			871.66
Tangelos	156,124.80	31,224.96	6,818.60	1,363.60			95.6	29,851.06	204.74
Tangerines	208,872.70	60,573.08	17,532.00	5,084.28			91.6	55,484.94	718.08
Temples	238,032.00	76,170.24	NC						
Tropical Fruit	28,750.00[n]	37,087.50	NC						
Watermelons	707,670.00	106,150.50	100,322.00	15,048.30			85.8	91,077.13	5,422.81
Fruit, Processed									
Canned & Chilled									
Non-citrus fruits	0.00	0.00	163,632.00	91,633.92	100.00	91,633.92			
Citrus Segments	58,091.52	39,502.23	7,792.00	5,298.56	86.6	34,208.93			478.28

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FLORIDA FOOD IMPORTS (continued)

COMMODITY	PRODUCTION Retail Weight (1,000 lbs)	PRODUCTION Retail Value ($1,000) (1980 dollars)	CONSUMPTION Retail Weight ($1,000 lbs)	CONSUMPTION Retail Value ($1,000) (1980 dollars)	% Import	Retail Value of Import ($1,000)	% Export	Retail Value of Export ($1,000)	to produce 100% of Fl Consumption
Fruit Juice									
Orange:									
concentrate	2,312,570.00	2,428,198.50	88,244.40	92,656.62			96.2	2,335,926.96	18,897.78
canned/chilled	1,583,125.80	585,756.55	72,076.00	26,668.12			95.4	558,811.74	4,114.01
Grapefruit									
concentrate	190,541.40	270,568.79	NC						
canned	491,478.40	152,358.30	30,096.60	9,329.95			93.9	143,064.45	1,687.96
Tangerine									
concentrate	21,420.00	29,345.40	NC						
canned	503.20	125.80	389.60	97.40			22.6	28.43	29.35
Blended citrus	38,904.40	12,838.45	584.40	192.85			98.5	12,645.88	
Dried Fruits	0.00	0.00	28,635.60	71,016.29	100.0	71,016.29			
Frozen Fruits	0.00	0.00	43,635.20	45,380.61	100.0	45,380.61			
Fats and Oils									
Lard	1,910.40	1,012.51	24,350.00	12,905.50	92.2	11,898.87			
Shortening	NC		178,242.00	135,463.92					
Oils	NC		221,098.00	176,878.40					
Grains									
Barley	0.00	0.00	11,688.00	9,817.92	100.0	9,817.92			9,290.38
Corn Cereal	insignificant		22,402.00	24,194.16	100.0	24,194.16			22,129.64
Corn meal	insignificant		73,050.00	15,340.50	100.0	15,340.50			31,085.11
Corn syrup, sugar, starch	insignificant		529,856.00	365,600.64	100.0	365,600.64			334,179.70
Oats	0.00	0.00	30,194.00	19,022.22	100.0	19,022.22			25,766.14
Rice	35,000.00	10,500.00	90,582.00	27,174.60	61.4	16,685.20			34,058.83
Rye (flour)	0.00	0.00	6,818.00	1,840.86	100.0	1,840.86			6,087.50
Sugarcane (sugar)	350,000.00[q]	175,000.00	563,946.00	281,973.00	37.9	106,867.77			97,013.22
Wheat (flour)	0.00[r]	0.00	1,139,580.00	205,124.40	100.0	205,124.40			728,065.00
Miscellaneous									
Coffee	0.00	0.00	68,180.00	143,859.80	100.0	143,859.80			NA
Honey	20,300.00	25,375.00	11,688.00	14,610.00			42.4	10,759.00	
Maple syrup	0.00	0.00	974.00	2,873.30	100.0	2,873.30			NA
Peanuts	79,508.00	162,991.40	59,414.00	121,798.70			25.3	41,236.82	41,132.77
Pecans	2,280.00	6,429.60	3,506.40	9,888.05	35.0	3,460.82			
TOTAL	15,835,260.65	9,251,177.59	11,852,657.92	9,459,166.53		4,967,468.95		5,980,365.80	11,452,553.62

FOOD IMPORT CHART NOTES

a. Using Florida Crop and Livestock Reporting Service, Florida Agricultural Statistics-Annual Summaries 1980: Livestock, Poultry, Dairy, Vegetable, Citrus, and Field Crops.

b. Prices supplied by U.S. Department of Labor, Average Retail Prices for the South (July-December 1980); Jacksonville stores-Food World, Publix, Pantry Pride, A & P and Winn Dixie; Orlando stores-Winn Dixie, Pantry Pride, and A & P; Walt's market, Sarasota; Dan Schantz Farm Market, Emmaus, PA; A & P, Allentown,

c. Using per capita consumption figures, USDA Food Consumption, Prices and Expenditures 1980 and Florida population 9,740,000.

d. For beef: William Lockeretz, Agricultural Resources Consumed in Beef Production 1975; for dairy: Dr. B. Harris, Professor of Nutrition, University of Florida.

e. By-product of the dairy industry.

f. Production values according to 1979 fish landings for east and west coast, edible weight (.6 x liveweight finfish) and (.45 x liveweight shellfish)

g. Land requirements for dairy products may be high due to double-counting of by-products.

h. Supplied by Pet, Inc.

i. Included in Minor Vegetables.

j. Estimate by Wayne Crain, Sweet Corn Exchange.

k. Supplied by Florida Lime and Avocado Administration Committee.

l. Supplied by T. E. Crocker, Associate Professor Fruit Specialist, University of Florida.

m. Ibid.

n. Florida Department of Agriculture and Consumer Services, Marketing Florida Tropical Fruits and Vegetables Summary 1980-81 Season,

o. Supplied by G. H. Snyder, Associate Professor of Soil Chemistry, Agricultural Research and Education Center, Belle Glade, Florida.

p. Florida produces 607 million pounds of soybeans, but has no soybean processors within the state.

q. Florida produces 21.2 billion pounds of sugarcane.

r. Florida has roughly 18,00 acres for corn silage; 360,000 acres corn for grain; 240,000 acres hay for livestock feed (1980).